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REMARKS

Rejection of Claims and Traversal Thereof~~Rejection of Claims and Traversal Thereof~~

In the November 11, 2004 Office Action:

claims 1-5, 7-17, 19, 21 and 28-30 were rejected under 35 U.S.C. §112, first paragraph;

claims 1-5, 7-17, 19, 21 and 29-30 were rejected under 35 U.S.C. §112, second paragraph;

claims 1-4, 7-17, 19, 21 and 28-30 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jin et al. (U.S. Patent No. 5,461,308) in view of Li et al. (U.S. Patent No. 5,487,356); and

claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Jin et al. in view of Li et al., and further in view of Vaartstra (U.S. Patent No. 6,010,969) and Donley (U.S. Patent No. 3,658,568) and Bloss et al. (U.S. Patent No. 4,857,361).

These rejections are traversed in application to the claims as amended herein. The patentable distinctions of the amended claims over the cited references are set out in the ensuing discussion.

Rejection under 35 U.S.C. §112, first paragraph

In the November 17, 2004 Office Action claims 1-5, 7-17, 19, 21 and 28-30 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description. According to the Office, there is not sufficient support for the manganate material having a Curie temperature in the range from 273 K to 324K. Applicants vigorously disagree because support for this range can be found in Table II, sample #107, at page 17 of the specification. As such, there is ample support for this Curie temperature range. However, to move prosecution forward, applicants have amended claim 1 and thus all claims depending therefrom and thereby obviating this rejection. Accordingly, applicants request the withdrawal of this rejection under 35 U.S.C. §112, first paragraph.

Rejection under 35 U.S.C. §112, second paragraph

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Claims 1-5, 7-17, 19, 21 and 29-30 were rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. Applicants have amended the claims thereby obviating this rejection. Accordingly, applicants request the withdrawal of this rejection under 35 U.S.C. §112, second paragraph.

Rejection under 35 U.S.C. §103(a)

In the November 17, 2004 Office Action, claims 1-4, 7-17, 19, 21 and 28-30 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jin et al. (U.S. Patent No. 5,461,308) (hereinafter Jin) in view of Li et al. (U.S. Patent No. 5,487,356) (hereinafter Li). Applicants traverse such rejection and submit that the proposed combination does not render the presently claimed invention *prima facie* obvious.

Applicants' claimed invention is as follows:

1. A method of forming a doped A-site deficient manganate material on a substrate from corresponding precursor(s), comprising liquid delivery and flash vaporization thereof to yield a precursor vapor, transporting the precursor vapor to a chemical vapor deposition reactor for chemical vapor deposition formation of the manganate material on the substrate, said manganate material having a formula of $\text{La}_x\text{M}_y\text{MnO}_3$, where M = Mg, Ca, Sr, or Ba, and $0.5 < (x+y) < 0.9$, and annealing the manganate material in an oxygen atmosphere for a sufficient time period to increase the Curie temperature of the manganate material in a range from 17 °C to about 50°C

Thus applicants claimed invention provides for a method of depositing a doped A-site deficient manganate material having a formula of $\text{La}_x\text{M}_y\text{MnO}_3$, where M = Mg, Ca, Sr, or Ba, and $0.5 < (x+y) < 0.9$ and that is subsequently annealed to raise the Curie temperature of the material in a range from 17°C to 50 °C. Notably, none of the cited references, either alone or in combination teach or suggest all the limitations of applicants' claimed invention.

According to the Office,

"Jin et al. does not explicitly teach that the A-site filling value (i.e., the sum of "w + x" as defined in Jin et al., or , in the applicant's claimed terms, the sum of "x +

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y" is between 0.5 and 0.9. However, the ranges of "w" and "x" taught by Jin et al. lead to an A-site filling value of between 0.5 and 0.9, and thus the A-site deficient manganate material of applicant's claims"

Applicants submit that the Jin et al. reference describes a multiplicity of possibilities as shown in the reference describes a text of the referenced patent, recreated below for ease of reference.

Suitable magnetoresistive films can be made of compounds of the form $A_wB_xC_zO_z$ where A is chosen from one or more rare earth elements (La, Y, Ce, Nd, Sm, Eu, Tb, Dy, Ho, Er, Tm, Yb and Lu). B is chosen from one or more group IIa elements of the periodic table (Mg, Ca, Sr, and Ba), or other elements such as Pb or Cd, and C is chosen from Cr, Mn, Fe and Co. Advantageously, $0.4 \leq w \leq 0.9$, $0.1 \leq x \leq 0.6$, $0.7 \leq y \leq 1.5$, and $2.5 \leq z \leq 3.5$. Preferably $0.5 \leq w \leq 0.7$, $0.15 \leq x \leq 0.50$, $0.8 \leq y \leq 1.2$, and $2.7 \leq z \leq 3.3$. In a preferred compound, A is La, B is Ca, Sr or Ba, and C is Mn. In a more preferred compound, B is Ca or Ca with partial substitution by Sr or Ba by not more than 40%.

Thus, one skilled in the art, reviewing the above text is certainly provided with many choices. Of course, it should be recognized that there is no suggestion for a range wherein the "w" and "x" are added together to suggest an advantageous range of $0.5 < (x+y) < 0.9$, as recited in the present invention. Clearly, there is no disclosure in Jin et al. and/or Li et al. that would provide any guidance to one skilled in the art to concentrate on the applicants' claimed range of $0.5 < (x+y) < 0.9$, which is clearly a sum less than one (1).

Thus, the Office appears to argue that it would be obvious for one of ordinary skill in the art to try every different combination of adding "w" to "x" of the Jin et al. reference in an attempt to recreate applicants' claimed invention without any guidance from either of the references. Clearly, by reviewing Jin et al., there is described a nearly infinite number of different possibilities and neither reference provides any suggestion as to which direction to proceed. With an infinite number of possibilities why would one skilled in the art go in the direction of applicants' claimed compositions especially when neither reference provides any examples of the claimed range wherein $x+y$ is more than 0.5 and less than 0.9.

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Applicants further argue that this rejection amounts to the application of an "obvious to try" standard which is known to be an improper standard for a §103 rejection. The Office contends that because the *Jin et al.* reference discusses a range for "w" and a range for "x" that there is sufficient teaching or suggestions to make the claimed invention obvious. However, the citing of a range for "w" and "x" provides no guidance for a combination range of $0.5 < (x+y) < 0.9$ and that the combination is a range of $0.5 < (x+y) < 0.9$ less than one (1).¹ Clearly, the cited prior art has not provided guidance as to the presently claimed methods.

The Board decision in *Ex parte Obukowicz*, 27 USPQ 2d 1063, 1065 (B.P.A.I.) (citing *In re O'Farrell*, 853 F.2d 894, 7 USPQ 2d 1673, 1681 (Fed. Cir. 1988)) is instructive and relative to the present rejection by the Office. In *Obukowicz* the invention concerned incorporating a DNA sequence, for a substance toxic to plant pests, directly into the genetic code of bacteria. The bacteria were then applied to plants whereon the bacteria produced and extruded the toxic substance, which in turn was consumed by the plant pests. The examiner initially rejected the claimed invention because a prior art reference mentioned combating mosquitoes using genetically engineered bacteria such as "natural pond microflora." However, the Board ruled that the mere mention of "natural pond microflora" was insufficient to provide the necessary suggestion of modification. As stated by the Board:

"the statement (in prior art) is but an invitation to scientists to explore a new technology that seems a promising field of experimentation. The Dean statement is of the type that gives only general guidance and is not at all specific as to the particular form of the claimed invention and how to achieve it. Such a suggestion may make an approach "obvious to try" but it does not make the invention obvious."

Likewise, in the present instance, a general statement about possible ranges for "w" and "x," without any additional guidance, is not sufficient to meet the Office's burden of establishing a *prima facie* case of obviousness.

¹ The admonition that "obvious to try" is not the standard Under §103 has been directed mainly at two kinds of error. In some cases, what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful. E.g., *In re Geiger*, 2 USPQ 2d 1278; *Novo Industri A/S v. Travenol Laboratories Inc.*, 215 USPQ 412 (7th Cir. 1982); *In re Yates* 211 USPQ 1149 (CCPA 1981); *In re Antonie* 195 USPQ 8-9. In others, what was "obvious to try" was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it. *In re Dow Chemical Co.*, 5 USPQ2d 1529 (Fed. Cir. 1985); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81 (Fed. Cir. 1986); *In re Tomlinson*, 150 USPQ 623 (CCPA 1966).

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Further, applicants submit that the claimed range of $0.5 < (x+y) < 0.9$ of the present invention was not a result of obvious experimentation, since any such experimentation would not have come from within the teachings of Jin et al. and/or Li et al. As stated above, the Office appears to suggest that it would have been obvious for one of ordinary skill in the art to try varying the amounts of "w" and "x" to optimize the effectiveness of the manganate material even if there is no evidence in the cited references that a particular additive combination, that being less than 1, affected the manganate material. Notable, all the compositions and suggested ranges shown in the Jin et al., taken as a whole, support applicants' position that an additive combination of $(x + y)$ being in the claimed range of $0.5 < (x+y) < 0.9$ and the combination value is less than 1 was not recognized to be important. Clearly, the low end of "x" in Jin et al. (0.1) added to the high end of "w" (0.9) is already equal to 1. As such, there is nothing in Jin et al. or Li et al. that would give an indication that the optimal range, being less than 1, is even important. Thus, there is a complete lack of understanding of the importance of a $(x + y)$ combination value being less than 1.

Additionally, conspicuously missing from the record is any substantive evidence that one of ordinary skill in the art would have been motivated to make the modifications of the prior art and select the specific range of $0.5 < (x+y) < 0.9$ to arrive at applicants' claimed invention. Jin et al. may state ranges for "w" and "x," however, as the Court pointed out in *In re Kratz*, 201 U.S.P.Q. 71 (C.C.P.A. 1979), "[e]ven if the bare lists of components found ...were in the prior art, those extensive lists are quite mute in directing one having ordinary skill in the art to any particular compound for any purpose." The Court in *Kratz* reversed the Examiner's rejection for obviousness, and stated that "for there to be a denial of patentability the prior art itself [should] further provide some foreseeability or predictability that the compound is a significant...ingredient." Consistent with such standard, there is a complete lack of any predictability as to what amounts of "w" and "x" would be effective in producing a manganate material that exhibited the effects of applicants' claimed invention. As stated at the bottom of page 7 and top of page 8, of the present specification:

"The shift in the transition temperature for an A site deficient (La+Ca):Mn film of these empirical tests is exemplified by the data shown in Figure 1. This same film was examined in high magnetic fields as shown in Figure 2. The film had a (La+Ca):Mn ratio of 0.73 and a measured T_c of 317°-K after thermal annealing in oxygen. Similar results were obtained for films deposited under identical conditions, but with varying film stoichiometries. The films with a stoichiometry of $\text{La}_{0.66}\text{Ca}_{0.33}\text{MnO}_3$ exhibited a T_c of 251 K, in agreement with the literature. However, when the (La+Ca):Mn ratio was reduced, the "as-deposited" films

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exhibited T_c values as high as 295 K. These same films all exhibited increased T_c values after thermal annealing in oxygen. These results point towards the possibility of a hole dependence in the conduction mechanism."

Applicants have found that the additive combination of $(x+y)$ being less than 1 and Mn being greater than 1 has a marked affect on the Currie temperature before and after annealing. Thus, when the ratio of $(x+y):Mn$ is less than one, and preferably in a range from 0.6 to 0.9, an MR response is observed at room temperature in small magnetic field.

The Office admits that "Jin et al. does not explicitly teach that the A-site filling value (i.e., the sum of "w + x" as defined in Jin et al. or, in the applicant's claimed terms, the sum of "x + y" is between 0.5 to 0.9," and then goes on to state that "[h]owever, the ranges of "w" and "x" taught by Jin et al. lead to an A-site filling value of between 0.5 and 0.9, and thus the A-site deficient manganate material of the applicant's claims."

However missing from this speculation is some motivation set forth in the prior art to make the claimed invention. Clearly, there is nothing in either reference that teaches this A-site filling value of between 0.5 and 0.9 and the Office cannot conjure this up or speculate by relying on something that is not disclosed. The Court's decision in *In re Spormann*, 150 USPQ 449 (CCPA 1966), bears directly on point:

"That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown"

Hence, obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 28 USPQ2d 1955 (Fed. Cir. 1993). Heretofore the understanding that when the additive combination $(x+y)$ is in the range of $0.5 < (x+y) < 0.9$, and the ratio $(x+y):Mn$ is less than one, and preferably in a range from 0.6 to 0.9, an MR response is observed at room temperature in small magnetic field was unknown. Therefore, how could a skilled artisan make any modification while arriving at an invention that possesses the heretofore unknown characteristic. While it is possible that, serendipitously, the invention would have such a feature, serendipity is not a valid basis for asserting obviousness. It is evident that the Office is relying on a hindsight reconstruction of the prior art to arrive at the present invention. Thus, this

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allegedly "obvious" modification is supported only by the Office's reinterpretation of the art in light of applicants' disclosure.

Applicants' claimed invention also expressly states that during the annealing process the temperature of the manganate material increases in a range from 170°C to about 500°C. Neither of the cited references discloses, teaches or suggests this limitation. For a proposed combination to meet the requirements of rendering a claimed invention obvious the combination must teach or suggest each and every element. The proposed combination of Jin et al. and Li et al. does not meet this standard.

Accordingly, applicants respectfully submit that claims 1-4, 7-17, 19, 21 and 28-30 as amended, are patentably distinguishable over the combination of Jin et al. and Li et al. Withdrawal of this rejection under 35 U.S.C. §103 (a) is requested.

In the November 17, 2004 Office Action, claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Jin et al. in view of Li et al., and further in view of Vaartstra (U.S. Patent No. 6,010,969) and Donley (U.S. Patent No. 3,658,568) and Bloss et al. (U.S. Patent No. 4,857,361). Applicants traverse the rejection and submit that regardless, of the teachings of Vaartstra, Donley or Bloss et al, the defects in the alleged *prima facie* case over Jin et al. in view of Li et al. are not cured by the addition of these additional references. Withdrawal of this rejection under 35 USC 103(a) is requested.

Fees Payable

Applicants have add one new dependent claim, however several claims have been previously cancelled, and as such, no fee is due for entry of this amendment. In the event a fee is found due for entry of this amendment, authorization is hereby given to charge any deficiency in applicable fees for this response to Deposit Account Number 08-3284 of Intellectual Property/Technology Law.

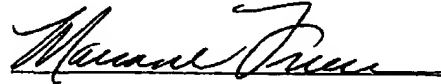
Conclusion

Applicants have satisfied the requirements for patentability. All pending claims are free of the art and fully comply with the requirements of 35 U.S.C. §112. It therefore is requested that Examiner

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Markham reconsider the patentability of claims 1-5, 7-17, 19, 21 and 28-30 in light of the distinguishing remarks herein and withdraw all rejections, thereby placing the application in condition for allowance. Notice of the same is earnestly solicited. In the event that any issues remain, Examiner Markham is requested to contact the undersigned attorney at (919) 419-9350 to resolve same.

Respectfully submitted,



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